

# **Wind turbine blade container rear-end collision**





## Overview

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Can automated blade collision detection be used on wind turbines?

**Abstract:** This paper presents an automated blade collision detection system for use on wind turbines, toward the goal of supporting monitoring and quantitative assessment of wind energy impacts on wildlife.

What happens to wind turbine blades during service?

Wind turbine blades are subject to complex environmental and mechanical loading during their service time, including cyclic deformation, rain, sand and contaminants causing erosion, icing, high moisture and temperature variations, but also extraordinary events, such as transportation damage, lightning strikes and bird impacts [9-12].

What causes a wind turbine blade to collapse?

**Structural Collapse and Buckling** The structural collapse of a wind turbine blade can occur if the blade is subject to extreme loads, exceeds its designed strength, and/or as a result of degradation and fatigue of the blade elements, which reduce its structural strength, thus making it more susceptible to extreme winds.

Can a wind turbine blade be pulled from its hub?

As a result of root end failure, the blade can be pulled from its hub during the service time. Lee et al. reported that blade failures observed in the field at Eclipse and Ocotillo wind farm in 2013 were caused by pulling out the blades from the wind turbines due to delamination at the root.



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Impact analysis of wind turbines subjected to ship collision ...

Jan 1, 2024 · The structural integrity of Offshore Wind Turbines (OWT) is of prime significance, due to the significant dynamic stresses generated by the extreme blast and impact loads. The ...

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Simulation Analysis and Safety Risk Assessment of a Wind Turbine Blade

Jun 2, 2025 · A common concern raised during the permitting of onshore wind farms is the potential risk posed by the release of failed turbine blades. Although there has been extensive ...

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Autonomous Sensor System for Wind Turbine Blade Collision Detection

May 24, 2021 · This paper presents an automated blade collision detection system for use on wind turbines, toward the goal of supporting monitoring and quantitative assessment of wind ...

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Reevaluating erosion of wind turbine blades in wind-blown ...

Dec 16, 2024 · Severe sand and dust storms are prevalent in western China, causing erosion of wind turbine blades and reducing their aerodynamic efficiency. Existing studies mostly use ...

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The complex end-of-life of wind turbine blades: A review of ...

Mar 1, 2022 · In order to provide the reader with an overview of the challenges related to the end-of-life of wind turbine blades, this review first describes the chain of processes taking place ...

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Joint responsibility in the development of ...

Apr 21, 2023 · Jointly, addressing the above-mentioned challenges and actively seeking for solutions will support the sound implementation of the ...

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Critical review of current wind turbine blades' design and ...

Mar 15, 2025 · In this review, the main design features and materials of wind turbine blades are presented and connected to the difficulties and opportunities related to the end-of-life ...

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What Happens to Wind Turbine Blades at the ...

Apr 17, 2025 · As global wind energy capacity surges--surpassing 138 GW in the U.S. alone as of 2022--attention has turned not only to turbine ...

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Autonomous Sensor System for Wind Turbine Blade Collision ...

Dec 2, 2025 · This paper presents an automated blade collision detection system for use on wind turbines, toward the goal of supporting monitoring and quantitative assessment of wind energy ...

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A review of impact loads on composite wind turbine blades: ...

May 1, 2023 · A fiber-reinforced composite wind turbine blade (WTB) is exposed to numerous



impact threats during its service life causing damages that can be detrimental to its structural ...

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Early Warning for Wind Turbine Blade Collision Using the ...

Early warning systems for blade collisions are crucial for taking proactive measures to prevent accidents and minimize losses. Current methods for detecting blade collisions face two main ...

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Joint responsibility in the development of effective wind-turbine

Apr 21, 2023 · Jointly, addressing the above-mentioned challenges and actively seeking for solutions will support the sound implementation of the black blade concept and other wind ...

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Investigating impacts of erosion on wind turbine blades

Dec 19, 2024 · Understanding erosion and deposition, and their impact on wind turbines, can help improve blade design and enhance turbine performance in dusty regions. Huang et al. ...

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Driver Lucky To Escape As Container Truck Is ...

Mar 17, 2025 · In a video posted to Twitter (above), we only see the aftermath. A semi-truck can be seen impaled upon a long wind turbine ...

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A State-of-the-Art Review of Structural Health Monitoring

Dec 1, 2025 · Wind turbine blades (WTBs) have increased in size and complexity, resulting in higher operational demands and maintenance costs. Damage to these blades can significantly ...

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Transport container for wind turbine blades

Mar 11, 2003 · A modularly extendible container system for transporting wind turbine blades is disclosed. The extendible container system includes at least one module (50, 52) configured to ...

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Wind turbine blade end-of-life options: An economic ...

May 1, 2022 · Although wind turbines are largely clean during operation, in manufacture and end-of-life stages they release emissions and consume significant energy. Wind turbine blades are ...

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Root Causes and Mechanisms of Failure of Wind Turbine ...

Jul 18, 2024 · Abstract: A review of the root causes and mechanisms of damage and failure to wind turbine blades is presented in this paper. In particular, the mechanisms of leading edge ...

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Damage analysis of ship collisions with offshore wind turbine

Oct 1, 2017 · To date, the damage analysis of collisions between infield support vessels and offshore wind turbine foundations has received very limited attention. In this study, a numerical ...

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Ship collision impact on the structural load of an offshore wind turbine

Feb 1, 2020 · In this paper, the structural load of a 4 MW offshore wind turbine was analyzed during a collision with an operations and maintenance ship. The variations in the wind speeds ...

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Investigating impacts of erosion on wind ...



Dec 19, 2024 · Understanding erosion and deposition, and their impact on wind turbines, can help improve blade design and enhance turbine ...

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